

CLAIMS

1. A battery powered shuttle car comprising:
a vehicle frame supporting a plurality of wheels including at least a left front wheel, a left rear wheel, a right front wheel, and a right rear wheel;
at least one motor coupled with the vehicle frame and the plurality of wheels; and
at least one battery operatively coupled with the motor, the battery powering the motor, wherein the battery is secured to the vehicle frame between one of (1) the left front wheel and the left rear wheel, and (2) the right front wheel and the right rear wheel.
2. A battery powered shuttle car according to claim 1, comprising at least two motors coupled with the vehicle frame and the plurality of wheels, and comprising two batteries, one of the two batteries being secured to the vehicle frame between the left front wheel and the left rear wheel, and the other of the two batteries being secured to the vehicle frame between the right front wheel and the right rear wheel.
3. A battery powered shuttle car according to claim 1, comprising four motors, one each operatively coupled with each of the plurality of wheels.
4. A battery powered shuttle car according to claim 1, wherein the at least one battery has a collective 500 amp hour capacity.
5. A battery powered shuttle car according to claim 1, further comprising at least one of a solid state IGBT and SCR-powered electronic direct current motor control operatively connected between the at least one battery and the at least one motor.
6. A battery powered shuttle car according to claim 1, further comprising a conveyor centrally disposed and coupled with the vehicle frame, wherein the at least one motor drives at least one of the plurality of wheels and the conveyor.
7. A battery powered shuttle car according to claim 1, further comprising a battery change-over mechanism coupled with the vehicle frame and including a pair of lever arms cooperating with structure extending outwardly from the at least one battery, and including at least one actuating mechanism powering the lever arms, wherein the actuating mechanism and the lever arms move the at least one battery from a position on the vehicle frame to a position on the ground or on a ground supported structure.
8. A battery powered shuttle car according to claim 1, further comprising a battery change-over mechanism including (1) a first overhead hoist that elevates the at least one

battery from the vehicle frame and that includes a battery charger that receives the at least one battery for charging, and (2) a second overhead hoist disposed adjacent the first overhead hoist, the second overhead hoist lowering charged batteries for attachment to the vehicle.

9. A battery powered shuttle car according to claim 8, wherein the battery charger comprises a charging station disposed remote from the first overhead hoist.

10. A battery powered shuttle car according to claim 1, further comprising a battery change-over mechanism for replacing the battery from the vehicle frame with a charged battery.

11. A battery powered shuttle car according to claim 10, wherein the battery change-over mechanism is a vehicle.

12. A battery powered shuttle car according to claim 1, comprising a receiving end and a discharge end, wherein the discharge end is integrated into the frame defining a one-piece frame construction, and wherein the discharge end has a substantially fixed height.

13. A battery powered shuttle car according to claim 12, further comprising a conveyor centrally disposed and coupled with the vehicle frame, and a full load indicator mechanism at least partially positioned adjacent the discharge end, the full load indicator mechanism providing an indication when the conveyor is substantially full.

14. A battery powered shuttle car according to claim 13, wherein the full load indicator comprises a sensing arm disposed in a material path of the conveyor, a pivot rod mounted in a bushing, and an indicator, the sensing arm and the indicator being connected to the pivot rod.

15. A battery powered shuttle car according to claim 1, comprising three batteries connected in series, one of the batteries being disposed between the left front wheel and the left rear wheel, another of the batteries being disposed between the right front wheel and the right rear wheel, and a last of the batteries being disposed in a central portion of the shuttle car.

16. A battery powered shuttle car according to claim 1, comprising three batteries connected in series, one of the batteries being disposed in substantial alignment with the left front wheel and the left rear wheel, another of the batteries being disposed in substantial alignment with the right front wheel and the right rear wheel, and a last of the batteries being disposed in a central portion of the shuttle car.

17. A battery powered shuttle car according to claim 1, comprising a plurality of batteries connected in series, the batteries being secured to the vehicle frame.

18. A battery powered shuttle car according to claim 1, wherein the at least one battery comprises a circuit breaker operatively associated therewith for disconnecting the battery when the circuit breaker is operated.

19. A battery powered shuttle car according to claim 18, wherein the circuit breaker is manually operated and is contained within an explosion proof housing.

20. A battery powered shuttle car according to claim 1, further comprising a safety circuit coupled with at least one of the motor and the battery, the safety circuit preventing the wheels from turning and engaging a parking brake.

21. A method of changing a battery mounted on a battery powered shuttle car, wherein the battery is mounted in alignment with one of (1) a left front wheel and a left rear wheel, and (2) a right front wheel and a right rear wheel, the method comprising:

securing at least one actuating mechanism to the battery mounted on the battery powered shuttle car;

driving the actuating mechanism to thereby move the battery off of the vehicle frame;

and

receiving the battery on an adjacent mechanism.

22. A battery powered shuttle car comprising:

a vehicle frame supporting a plurality of wheels;

at least one motor coupled with the vehicle frame and the plurality of wheels; and

a plurality of batteries connected in series and operatively coupled with the motor, the batteries powering the motor, wherein at least some of the batteries are secured to the vehicle frame in a side-saddle mounting.